

Urologic Manifestations of Acute Appendicitis Secondary to Metastatic Cervical Cancer

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Acute abdominal pain may be attributed to a variety of medical or surgical conditions. Acute appendicitis, a common entity in differential diagnosis, may present with diverse clinical manifestations. It may occasionally mimic urogenital disorders and be particularly challenging to diagnose in women. We report a 34-year-old woman who had undergone radical hysterectomy 2 years previously for stage Ib cervical cancer. She presented with lower abdominal pain, dysuria, and fever of 2 days' duration, unrelieved by 5 days of antibiotics. Computed tomography revealed an enlarged appendix surrounded by an abscess, and appendectomy was performed. Pathologic examination of the surgical specimen revealed metastatic cervical cancer in the appendix. Patients with acute appendicitis may manifest with urologic disorders that can be caused by metastatic tumor. [*J Formos Med Assoc* 2007;106(9):784–787]

Key Words: abdominal pain, acute appendicitis, acute pyelonephritis, cervical cancer, metastasis

Acute appendicitis is a very common cause of acute abdomen. Early diagnosis and prompt surgery are indicated to minimize complications such as perforation, abscess and peritonitis. It is not unusual for acute appendicitis to present with atypical symptoms, perhaps resulting in delayed diagnosis and therapy.^{1,2} We report a woman who not only had an atypical presentation but whose appendicitis also turned out to have a very unusual cause.

Case Report

A 34-year-old aboriginal woman had undergone radical hysterectomy and radiation therapy for stage Ib cervical cancer 2 years previously. One

week prior to the present admission, she had had routine follow-up for the cancer. The serum squamous cell carcinoma antigen level (3.4 ng/mL) was slightly elevated, but abdominal computed tomography (CT) did not reveal any evidence of cervical cancer. She then noted the onset of dull pain in the lower abdomen and right flank for 2 days, accompanied by dysuria, fever, fatigue and anorexia, but no vomiting. She had normal flatulence but only passed small amounts of mucoid stool. The abdominal pain persisted and began to radiate to the epigastrium. On presentation to the emergency room, she was found to have pyuria, and a diagnosis of acute pyelonephritis was made. Her temperature was 38.8°C. There was no cervical adenopathy, and heart and lung examinations were normal. The abdomen appeared to

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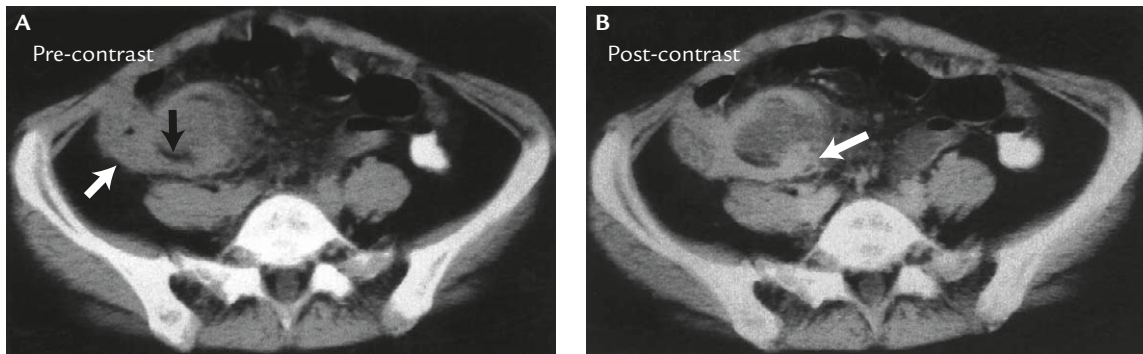


Figure 1. Abdominal computed tomography (CT) images indicate a ruptured appendix with surrounding abscesses. (A) Unenhanced scan shows thickening of the cecum (white arrow) and gas within a nearby soft tissue mass (black arrow). (B) Contrast-enhanced scan demonstrates a well-visualized thick wall around the mass, which contains an enlarged tubular appendix (white arrow).

be slightly distended; bowel sounds were present. There was tenderness in the mid-abdomen and right lower quadrant. No hepatosplenomegaly or abdominal masses were appreciated, but there was costovertebral angle punch tenderness. There was leukocytosis with left shift (white blood cells, 13,900/ μ L; segmented neutrophils, 82%) in addition to mild anemia (hemoglobin, 10.1 g/dL; hematocrit, 30.4%). Liver and kidney function tests were normal, as were measurements of amylase and lipase. Albumin, however, was low (2.8 g/dL). On urinalysis, there was >100 white cells/high-powered field but no hematuria. *Trichomonas vaginalis* was seen on microscopic examination of the urine.

The patient was treated with intravenous cefamezine and gentamycin for presumed pyelonephritis, along with oral metronidazole for the trichomonas infection. However, her fever and poor appetite persisted. Further evaluation included upper gastrointestinal endoscopy, which showed mild gastritis but no ulcer, and abdominal ultrasound. The latter demonstrated fatty liver and gallstones but no evidence of cholecystitis. The kidneys were of normal size without stones or hydronephrosis. Over the next several days, the patient's pain gradually became localized to the right lower quadrant, and she developed rebound tenderness in that area. Urine culture was reported as having no growth. The fever began to subside on the 5th hospital day, but abdominal CT was performed because of the localized pain.

It showed an enlarged appendix with surrounding abscesses (Figure 1). Intraoperatively, a ruptured retrocecal appendix was found. Unexpectedly, pathologic examination of the appendiceal specimen demonstrated metastatic cervical cancer cells (Figure 2). The patient recovered well from the operation, after which she underwent chemotherapy for her metastatic cervical cancer.

Discussion

Acute appendicitis results from obstruction of the appendiceal lumen by a fecal stone, appendiceal stone, hyperplasia of the lower epidermal lymphatic tissue, parasites, or tumors. Classic symptoms of acute appendicitis are initial upper mid-abdominal or periumbilical pain, frequently accompanied by poor appetite, nausea and vomiting. The pain then migrates to the right lower quadrant. There is usually a mild fever and leukocytosis. If the temperature exceeds 38.3°C, perforation of the appendix should be suspected. Only 50–60% of patients with acute appendicitis have the classic symptoms; atypical manifestations are therefore quite common.³

Since the position of the appendix may vary considerably, confusion in diagnosis may arise. If the appendix is retrocecal, the disease may present with urogenital symptoms or an abnormal urinalysis, as in our patient, resulting in delayed diagnosis and treatment.^{1,2} Reported urologic

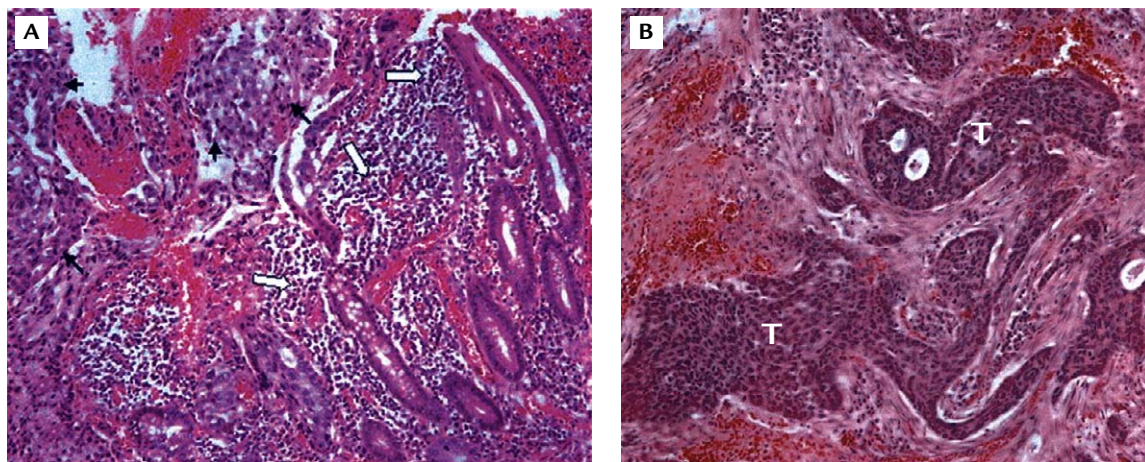


Figure 2. Histopathology of the resected appendix (hematoxylin & eosin, original magnification 100×). (A) Inflammatory cells surround a mucosal gland (white arrows) and polymorphic tumor cells are seen near the gland (black arrows). These were consistent with (B) cervical tumor cells (marked "T") obtained 2 years previously at hysterectomy.

symptoms include hydronephrosis, caliceal rupture, and ureteral obstruction. Lower urinary tract manifestations may suggest cystitis, a bladder mass or prostatitis. Men may have pain or masses in the scrotum, while women have been reported to have appendicitis associated with cervical motion tenderness and adnexal pain or masses suggestive of torsion.¹ Hematuria or pyuria reportedly occurs in 20–30% of patients with acute appendicitis, most often due to an inflamed or ruptured appendix just adjacent to the urinary tract.² Some patients have even been reported to have urine cultures positive for the same bacterial strain grown from appendiceal cultures. In these cases, it is believed that bacteria were disseminated from the appendix to the posterior peritoneal cavity and from there invaded the urinary tract.⁴

Other atypical presentations may include sub-acute or chronic discomfort. The patient's history may be inconsistent, the physical examination confusing, or there may be evidence that seems to support a different diagnosis. This was the situation with our patient, in whom the initial diagnosis of acute pyelonephritis seemed quite reasonable. In fact, the correct diagnosis is often particularly challenging in women, given the multiplicity of obstetric and gynecologic conditions that may include pain similar to that of appendicitis.

In addition to close monitoring of patients with abdominal pain and serial physical examinations, several imaging studies may be of value. Abdominal ultrasound is convenient and may demonstrate an inflamed appendix or thickened appendiceal wall, while at the same time excluding obstetric and gynecologic disorders such as abscesses involving the adnexae. However, inter-operator variation in technique may affect the accuracy of transabdominal ultrasound, as can patient characteristics such as weight, the thickness of the abdominal wall muscles, and the depth of the appendix. Thus, it has been suggested that transvaginal ultrasonography be added to enhance diagnostic accuracy.⁵ Even then, ultrasonography is not sensitive enough to exclude the diagnosis, even if the appendix is not clearly visualized.

If ultrasonography is unhelpful, abdominal CT may be of more value.⁶ Findings may include an appendicolith, appendicitis, and appendiceal wall thickening. In addition, phlegmons or abscesses can be seen to involve the appendix or the surrounding area of the cecum. A thickened cecal or ascending colon wall may also be observed. At the same time, CT can also exclude other possible intra-abdominal disorders. As with ultrasound, however, a normal CT does not completely exclude the possibility of acute

appendicitis. A technetium-99 m hexamethylpropyleneamineoxide-labeled white blood cell scan has been used to look for localized inflammation. A study of 50 women with atypical appendicitis at the China Medical University Hospital showed this nuclear medicine test to be more sensitive and accurate than abdominal ultrasound.⁷

In addition to her atypical presentation, another unusual feature in our patient was the metastatic lesion that appeared to have induced her appendicitis. It is uncommon to find metastases in the appendix, and reports of acute appendicitis secondary to metastasis are rare. Primary tumors reported to involve the appendix include those in the colon, stomach, lung, breast and nasopharynx, as well as leukemia and lymphoma.^{8–12} There are only a handful of reports of cervical cancer metastasizing to the appendix. However, given this possibility, if a patient with a history of cancer develops acute appendicitis, metastatic disease in the appendix should be considered. It would not change the need for immediate appendectomy, but a careful pathologic examination should be done. If metastases are found, it may significantly impact tumor staging, with consequent effects on therapy and prognosis.⁹ It has been suggested, for instance, that individuals undergoing oophorectomy for breast cancer or laparotomy for other reasons should also have an incidental appendectomy.¹²

In summary, inclusion of acute appendicitis in the differential diagnosis of abdominal pain should not be limited to patients with typical presentations. Rather, a high index of suspicion should be maintained even for something as straightforward-appearing as acute pyelonephritis. It is also well to remember that, though very unusual, acute appendicitis may actually be a manifestation of metastatic disease.

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